



Andree Clark Bird Refuge Vegetation Maintenance and Restoration Project Biological Assessment

July 2011

Project No. 30174232.00

Prepared For:

City of Santa Barbara, Parks and Recreation Department

U.S. Fish and Wildlife Service



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Prepared by

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Acronyms

BA	Biological Assessment
BMP	Best Management Practice
CDFG	California Department of Fish and Game
ESA	Endangered Species Act
MBTA	Migratory Bird Treaty Act
ppt	Parts per thousand
USFWS	U.S. Fish and Wildlife Service

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Chapter 1

Introduction

The purpose of this biological assessment (BA) is to provide technical information and to review the proposed project in sufficient detail to determine to what extent the Andree Clark Bird Refuge Vegetation Maintenance and Restoration Project (Project) may affect threatened, endangered, or candidate species. The BA is prepared in accordance with legal requirements found in Section 7(a)(2) of the federal Endangered Species Act (ESA) (16 United States Code [USC] 1536[c]).

1.1 Project Location

The project area is located at 1400 East Cabrillo Boulevard, Santa Barbara, CA. The Andree Clark Bird Refuge (Refuge) is one of the largest wildlife refuges in Santa Barbara County made up of a 42-acre open space park with a 29-acre brackish lake and associated marsh. The Refuge is located between Highway 101 and East Beach (Figure 1-1). It is bounded on the north by the Southern Pacific Railroad, on the west by the Santa Barbara Zoo, on the south and southeast by Cabrillo Boulevard, and on the northeast by Los Patos Way. The Refuge is part of the larger Sycamore Creek Watershed that covers approximately 2,600 acres with headwaters in the Los Padres National Forest (City of Santa Barbara 2007). Approximately nine miles of creeks and tributaries flow from the Santa Ynez Mountains through Parma Park and the Riviera neighborhoods, down through the largely undeveloped Sycamore Canyon, and finally into the ocean at East Beach (City of Santa Barbara 2007). The Refuge, however, has no hydrologic connection to Sycamore Creek, and its watershed is described below.

1.2 Site Background

Historically, the Andree Clark Bird Refuge area was a salt marsh, receiving fresh water from Sycamore Creek (CSBED 2005). However, the construction of the railroad in the 1880's resulted in rerouting Sycamore Creek, thereby isolating the salt marsh (CSBED 2005). The Refuge lake is an artificially modified estuary that supports palustrine wetlands. The city purchased the salt marsh in 1909 as a park. In 1929, Huguette M. Clark donated \$50,000 to provide a refuge for migrating birds and named the lake for her daughter (Penfield & Smith 1985). The 844-acre watershed is predominantly urban (large lot residential) but also contains a golf course, tennis courts, a portion of the Zoo, and a cemetery. Runoff from the watershed, including roadways (City streets, U.S. 101, and Cabrillo Boulevard), enters the lake via a mix of open channels and storm drains. The Refuge lake is considered brackish because salinity is above 0.5 parts per thousand (ppt), probably due to leaching of salts from the former salt marsh sediments and evaporation. The Refuge lake is connected to the Pacific Ocean through a tidegate system located adjacent to the north side of Cabrillo Boulevard and passing under that roadway. A weir gate in the outflow channel to the Pacific Ocean separates the lake from a coastal lagoon.

1.3 Purpose and Need

The City of Santa Barbara Parks and Recreation Department (City) provides maintenance of the Refuge, including the brackish lake with three islands. The City proposes one-time, followed by routine, vegetation management in the lake over a 5-year period in order to restore and maintain water circulation, prevent flooding, and provide access for vector control personnel for mosquito abatement. The tule mosquito (*Culex erythrothorax*) and other mosquito species are known to occur within the Refuge. Sediment and vegetation built up in the Refuge impedes the flow of water and provides a breeding ground for mosquitoes known to cause West Nile Virus. Proposed vegetation maintenance activities include the removal and disposal of approximately 0.9 acre of emergent vegetation with mechanical equipment or, in limited access areas, by hand crews. The majority of the work would occur in year one of the 5-year period, with the remaining years to be used for follow-up maintenance in previously cleared areas, spot clearance, and habitat enhancement and restoration.

1.4 Species Addressed

This BA addresses the following federally listed endangered, threatened, and candidate species potentially present in the action area, based upon a literature review and existing biological surveys: tidewater goby (*Eucyclogobius newberryi*) and western snowy plover (*Charadrius alexandrinus nivosus*). A detailed discussion of the two covered species' life histories and the potential for these species to be present in the project area is provided in Section 4.

To determine listed species within the project area or within a two-mile-radius of the Project area, a search was conducted using the California Natural Diversity Database (CNDDDB). The query results list four federally listed species with historical occurrence within two miles of the Project. These include tidewater goby (*Eucyclogobius newberryi*), western snowy plover (*Charadrius alexandrinus nivosus*), California red legged frog (*Rana draytonii*), and Gambel's water cress (*Nasturtium gambelii*).

The record for California red-legged frog occurrence is from a 2002 observation of juvenile and larval frogs in a series of manmade pools in Cinquefoil Creek, 0.35 mile north of the confluence of Hot Springs and Cold Springs Creeks, Montecito. This location is 1.87 miles from the Refuge, in a separate drainage with no hydraulic connectivity to the Refuge. Overland migration from that drainage to the Refuge is extremely unlikely given the highly urbanized city setting. Therefore, California red-legged frogs are considered very unlikely to occur in the Refuge and are not considered in this BA.

The occurrence record for Gambel's water cress is based on the type locality record in the 1876 Gambel Collection. Gambel's water cress is considered extirpated from Santa Barbara (CNDDDB 2011). Its nearest known occurrences to the Project area are at Oso Flaco Lake at the Guadalupe-Nipomo Dunes and on coastal land on Vandenberg Air Force Base, Santa Barbara County (Center for Plant Conservation 2010). Therefore, Gambel's water cress is not considered in this BA.

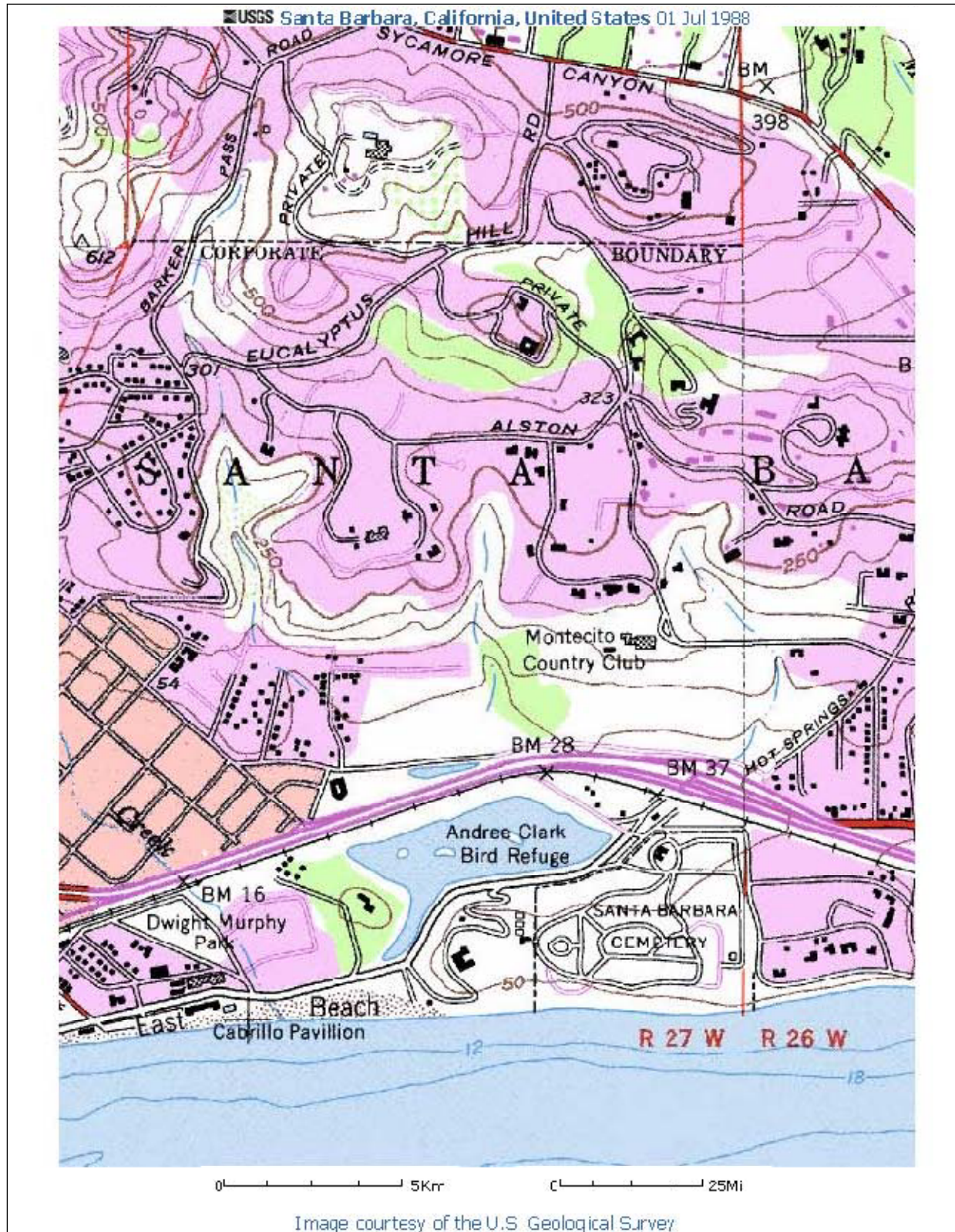


Figure 1-1. Topographic Map of Project Vicinity (Terraserver-USA.com Dec08)

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Chapter 2

Project Description

This section presents the proposed actions which will be implemented by the City. Because the proposed project has the potential to impact federally protected species, the U.S. Fish and Wildlife Service (USFWS) has regulatory jurisdiction over this project.

This BA addresses activities that require a Federal action in order to be implemented within the Andree Clark Bird Refuge. The proposed project consists of one-time maintenance and routine maintenance, including vegetation management in aquatic Refuge habitats. Work would occur over a five-year period. Vegetation management activities would be performed in order to increase the flow of water, open waterways, reduce flooding, and restore habitat. Work will discourage mosquito breeding by providing circulation of water, access for vector control boats to apply larvacide (*Altosid*; Bti), and increase access for mosquitofish (*Gambusia affinis*) to enter areas harboring mosquito larvae. Maintenance will also be performed for flood control purposes and will help restore flow in the channel and Refuge. Finally, restoration of upland and wetland areas with native plants to enhance wildlife habitat will be performed. Through implementation of the proposed project, the City will:

- Remove approximately 0.93 acre of emergent vegetation, including rhizomes and roots, and maintain those areas, as needed, during the five-year maintenance period.
- Remove floating emergent vegetation as it senesces or dislodges from rooted locations; and
- Perform wetland and upland habitat restoration.

2.1 Aquatic Vegetation Removal, Clean-Up, and Disposal

Plants identified to be removed or cut consist of emergent wetland vegetation in the Bulrush Series (*Scirpus californicus*=*Schoenoplectus californicus*; tules), Cattail Series (*Typha domingensis*), and Bulrush-Cattail Series. Vegetation categories are according to Sawyer and Keeler-Wolfe (1995). Five acres of these marsh vegetation types occur around the wetted perimeter of the Refuge (SAIC 2010).

A contractor, under the direction of the City, will perform the cut, harvest, and removal of emergent vegetation at the specified locations. Construction equipment would include an aquatic reed cutter (“cookie cutter”), aquatic harvester, backhoe, and hauling trucks. Aquatic equipment ingress/egress to the water will occur at the open area south of the parking lot (the “beach”).

The “cookie cutter” incrementally cuts/shreds emergent vegetation in sections above and below the water, including the root system, with two rotating wheels. Cutting will be performed by starting the shredding at the top of the tules/cattails and will make its way down to the plant rhizomes. The machine will cut into the soil only as far as needed to destroy the root zone. The machine moves perpendicular to the shoreline or along the pathway to be cleared and needs a water depth of at least 20 to 30 inches to float. When moving into a dense area of emergent

vegetation, the path created provides access. After a pass with the cookie cutter, the harvester comes in, scoops up the debris onto a conveyor belt, and shredded vegetation is unloaded at the shoreline for disposal. Figures 2-1 and 2-2 depict the cookie cutter and harvester, respectively.



Source: Clean Lakes, Inc.

Figure 2-1. Cookie Cutter



Source: Clean Lakes, Inc.

Figure 2-2. Harvester

Vegetation debris deposited on shore will then be loaded into a storage bin or vehicle and disposed of offsite. In shallow areas where aquatic equipment is not able to operate, work will be performed by contractors from the shore. Also, work within the box culvert and channel on the north side of the Refuge will be performed by contractors with construction equipment located in upland areas or by crews with hand equipment. Areas identified for the removal of emergent vegetation total 0.93 acre (Table 2-1, Figure 2-3), including their rhizomes and roots.

Removal areas in and associated with the Bird Refuge include:

- A Around the three viewing platforms located along the northern border (A1, A2, A3),
- B The grouted sandstone box culvert along Old Coast Highway (B1) and the concrete-lined channel that enters the bird refuge from the northern border (B2),
- C Between the western island and the northern shore,
- D A large stand of emergent vegetation at the southeast corner, and
- E Scattered locations along the perimeter, including the beach.

Table 2-1 Impact Areas and Acreage

Area	Area Description	Area (acres)
A	Viewing platforms A1, A2, and A3	0.10
B1	Concrete box culvert along Old Coast Highway	0.03
B2	Concrete-lined channel extending into Bird Refuge	0.04
C	Between western island and shore	0.56
D	Southeast corner	0.10
E	Beach and scattered along perimeter - estimated	0.10
TOTAL		0.93

Area A

Removal of vegetation around three viewing platforms, A1, A2, A3 in Figure 2-3, will provide water circulation in the vicinity of the platforms and open visibility for bird and wildlife viewing. The reed cutter and harvester would be used to complete 1,200 square feet of emergent vegetation removal around each of the three platforms, for a total of 0.1 acre. The far western platform (A1) is completely enclosed by aquatic vegetation and removal of additional vegetation is addressed in “C”.

Area B

An open box culvert (B1), located upstream (north) from the bird refuge between the City’s municipal tennis courts and Old Coast Highway, conveys water from Old Coast Highway to reinforced concrete pipes beneath Highway 101 and the railroad trestle, and empties into a concrete-lined channel (B2) at the northern end of the bird refuge.

B1. The open box culvert is constructed of sandstone boulders and cobbles grouted with concrete and measures 5 feet wide by 400 feet in length. Sediment has settled and emergent vegetation has rooted within $\frac{3}{4}$ of the culvert. A total of 0.03 acre of emergent vegetation and 123 cubic yards of sediment and trash will be removed from the box culvert.

B2. The concrete-lined channel (sides and bottom) extends into the bird refuge approximately 130 feet south of the railroad trestle (see Figure 2-3). The channel measures 15 feet wide by 70 feet in length from the trestle to the foot bridge and measures 10 feet wide by 60 feet in length from the foot bridge to the terminus of the channel. Sediment has settled and emergent vegetation has rooted within the length of the concrete-lined channel. A total of

0.04 acre of emergent vegetation and 330 cubic yards of sediment will be removed from the channel.

Vegetation and sediment will be removed from the box culvert and channel to restore the water conveyance of these storm drain structures. Work will be completed by backhoe or bucket from the adjacent upland during year one. Regular maintenance will be performed within the box culvert and channel on an annual or biennial (every two years) basis, as needed to keep them free of vegetation and silt.

Area C

At one time, the western island was completely isolated from the northern shore of the bird refuge. Over time sediment has built up between the end of the concrete channel (B2) and the island. Emergent wetland vegetation has taken root in this area. This vegetation continues to trap sediment, resulting in a boggy path to the western island. This stand of emergent vegetation can be seen in Figure 2-3. The reed cutter and harvester will be used to remove 0.56 acre of emergent wetland vegetation during year one. A border of emergent vegetation around the island and mainland shores would be left in place as wildlife habitat.

Area D

A large stand of emergent vegetation exists in the southeast corner of the Refuge lake. The reed cutter and harvester will be used to open access for vector control boats and increase access for mosquitofish. Equipment will also be used along the edge of the lake to remove “floaters” that break away from the edge of the stand for a total of 0.1 acre of emergent vegetation removal in Area D.

Area E

Boating by the public is not allowed within the Refuge although department staff and other personnel launch small boats into the lake for maintenance and vector control. The “beach”, a sandy area south of the bird refuge parking lot, and the portion of the lake directly adjacent are kept clear of terrestrial and emergent vegetation for boat launching. This area is also kept clear for Refuge wildlife viewing purposes. Emergent vegetation is removed from the lake adjacent to the beach by wrapping chains or rope around clumps of vegetation and pulling the vegetation landward from the shore with a backhoe or truck.

Additional scattered areas along the perimeter of the bird refuge may require vegetation pulling or cutting, depending on density. Cutting may be required if vegetation density increases, circulation decreases, and vector control or other City personnel cannot access the area. The locations, other than the beach, are not known at this time.

2.1.1 Schedule

The cookie cutter and harvester require a minimum of 20 to 30 inches of water in order to operate; therefore, work is proposed to begin after winter rains have increased the depth of the relatively shallow Refuge lake. This portion of the project is dependent upon environmental conditions, and aquatic vegetation cutting and harvesting is estimated to begin in January or

February 2012. Vegetation maintenance in year one is estimated to occur over ten working days. Follow-up maintenance would occur annually over the next four years, as needed. Habitat restoration would begin with the removal of non-native plant species in year one. A portion of the aquatic plant installation may occur in year one, as weather and plant availability allows. The balance of restoration plant installation, including watering and maintenance, would proceed in the fall/winter of year two.

Terrestrial construction equipment and hand tools will be used to complete the work within the box culvert (B1) and in the concrete-lined channel (B2) during year one. Although that work is not dependent upon winter rains, it will likely be completed in tandem with the other year one Refuge vegetation clearance.

2.1.2 Follow-up and General Maintenance

Emergent vegetation may re-establish in Areas A through D. Follow-up maintenance, similar to what has been described, would be performed as needed to keep waterways open. However, the re-use of mechanized equipment such as the cookie cutter and harvester is unlikely. The amount of repeat emergent vegetation removal is not known at this time.

2.2 Dislodged (Senescent and/or Green) Aquatic Vegetation Maintenance

Aquatic emergent vegetation breaks away from rooted locations, floats in the Refuge lake, and has the potential to clog the tidegate weir. Vegetation clumps (floaters) are senescent and/or green. Floaters occur especially during winter storms when elevated water levels lift dislodged vegetation from their resting place, and circulating water or wind pushes loose vegetation around the lake. Vegetation transported to the weir can obstruct the overflow and that results in flooding along Cabrillo Boulevard. As a preventative measure, staff currently remove floating vegetation with hand equipment from a small boat or pull it landward from the shore. This practice will continue over the five-year maintenance period, as needed.

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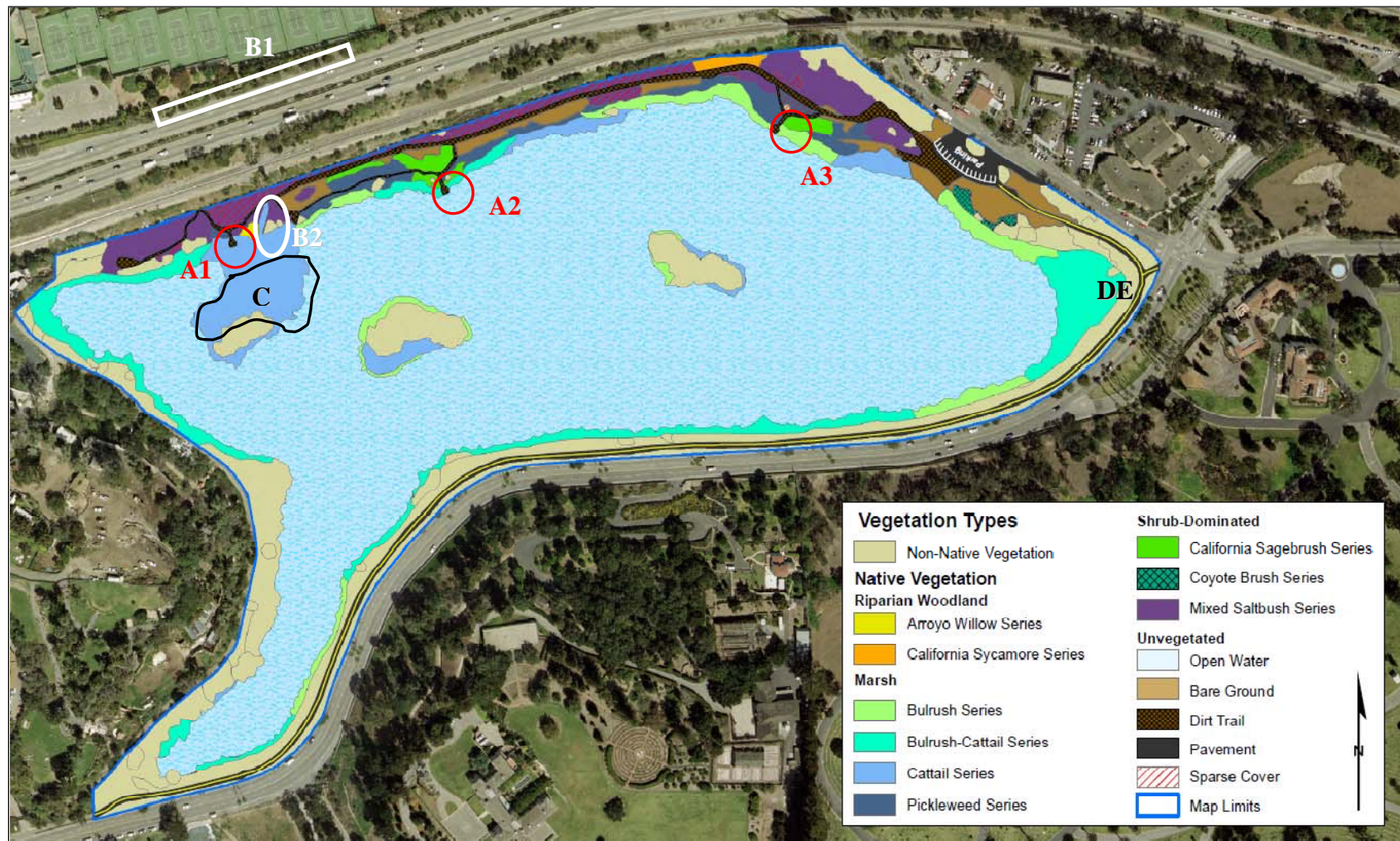


Figure 2-3. Vegetation Maintenance Areas at the Andree Clark Bird Refuge.

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2.3 Habitat Restoration

Vegetation management at the Refuge would include wetland habitat restoration, enhancement, and/or creation (Figure 2-4). Habitat restoration would be achieved through installation of native plant species around the perimeter of the Refuge and east side of the Zoo and the removal of non-native vegetation. A 6-foot-wide strip of tules will be planted along the south, west, and northwest shore of the Bird Refuge lake along the lake side of the existing tules where water depths are suitable for wetland creation. Additional *Scirpus* and *Juncus* species native to the watershed may be planted in order to increase wetland diversity in the Bird Refuge. Riparian habitat enhancement will occur at the edge and above the water line and may include pickleweed (*Salicornia californicus*), alkali heath (*Frankenia salina*), saltgrass (*Distichlis spicata*), willows (*Salix lasiolepis*, *S. exigua*), western sycamore (*Platanus racemosa*), mugwort (*Artemisia douglasiana*), California rose (*Rosa californica*), and common rush (*Juncus patens*). Non-natives to be removed are primarily Myoporum (*Myoporum laetum*) and castor bean (*Ricinus communis*) but may include other exotic invasive species.

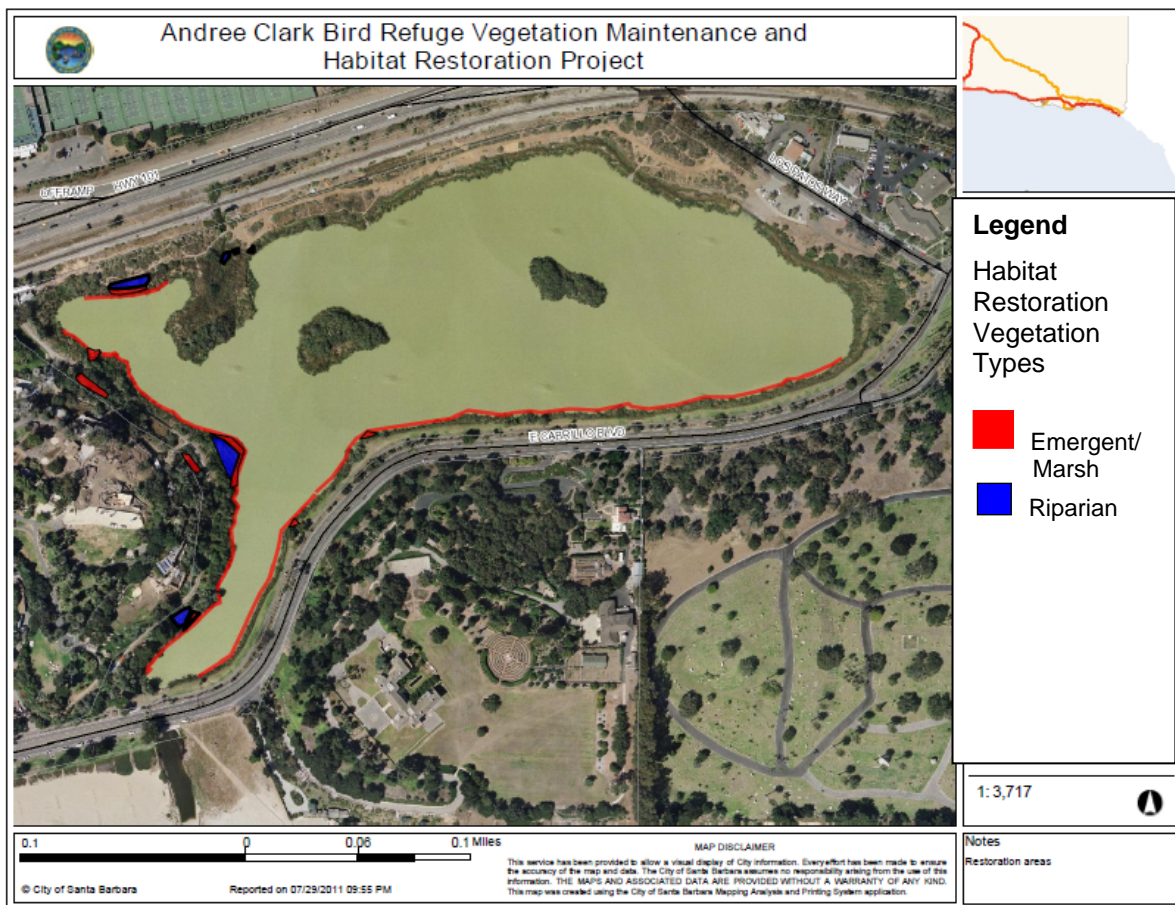


Figure 2-4. Habitat Restoration Areas

2.4 Protection of Biological Resources

Avoidance and preventative procedures will be implemented prior to and during maintenance activities in order to protect sensitive wildlife species and habitats. A review and report of breeding birds, specific to the Refuge, has been prepared (MRS 2011), and work is proposed to occur outside of the nesting season for most bird species breeding in aquatic and adjacent upland habitats. The song sparrow and raptors, if present, have the potential to nest during the work. Biologists also performed tidewater goby and herpetofauna surveys to document the species in the Refuge. Tidewater gobies are known to exist within the Refuge.

2.4.1 Best Management Practices

This section describes the Best Management Practices (BMPs) that the City will use during the Project, to the extent applicable and feasible. The Project has been designed to limit impacts to biological resources, including aquatic resources and water quality. Proposed BMPs to be implemented as needed are summarized below.

2.4.1.1 *Designated Areas*

- Work crews will be restricted to designated and clearly defined work areas. Staging of equipment and temporary dump sites shall be restricted to designated areas.
- Any waste materials produced by removal activities will be temporarily stored away from the lake margin and will be removed for disposal in an approved disposal site.
- All materials, wastes, and equipment will be removed from construction sites as soon as practical after use and at the completion of construction.

2.4.1.2 *Equipment Maintenance*

- All power equipment and vehicles will be kept in good working order and inspected each day for leaks prior to use. Leaks will be repaired immediately or problem vehicles or equipment will be removed from the Project site. Equipment will be staged in containment or other suitable barriers overnight to prevent accidental leakage of fluids.
- All power equipment will be staged over tarps, or in holding pens with walled sides, to catch any leakage of fuel, oils, and other liquid to prevent these materials from soaking into the soil, or being carried into the lake.
- Refueling will only take place in a designated area away from the lake. Refueling of the cookie cutter and harvester, if not feasible to do on land, will be conducted so that no fuel is spilled into the water. No foreign materials, such as petroleum or other fuels, will be released into the lake. During refueling of equipment, a drip pan shall be used to ensure that no fuel spills onto the ground or in the lake.
- Appropriate firefighting equipment (e.g., extinguishers, shovels) shall be available on site during all phases of the Project, and appropriate fire prevention measures shall be taken to help minimize the chance of human-caused wildfires.

2.4.1.3 *Hazardous Materials Management and Spill Prevention*

- Drip pans or absorbent pads will be used during vehicle and equipment fueling. Absorbent spill clean-up materials and spill kits will be available in fueling areas, and workers will be trained in their use. Fuels will be stored in containment basins.
- Appropriate spill containment and clean-up materials will be available on site at all times. Any spills will be cleaned up immediately and will not be buried or washed with water.
- Used clean-up materials, contaminated materials, and recovered spilled materials that are no longer suitable for clean-up will be stored and disposed of properly. Hazardous and non-hazardous material will be disposed of in the manner specified by the manufacturer.

2.4.1.4 *Erosion and Sediment Control*

- Sand bags, straw bales, straw wattles, or other erosion control materials will be used during restoration to dissipate the energy of flowing water, reduce soil erosion, and prevent sediment or other materials from entering the lake.

2.4.2 Vegetation Avoidance and Protection Measures

This section describes the vegetation avoidance and protection measures. The City will implement the following measures, as applicable.

- Define and respect clear work area limits.
- Cleared or trimmed vegetation and woody debris shall be disposed of in a legal manner.
- Precautions shall be taken to avoid damage to non-target vegetation by people or equipment.
- To prevent the introduction of new invasive animals and weedy plant species, the City shall require the designated contractor to ensure that work boots, vehicles, and equipment have been cleaned prior to starting work on the Project.

2.4.3 Wildlife Avoidance and Protection Measures

The following describes the general wildlife avoidance and protection measures that the City will use during Project implementation, to the extent feasible and appropriate for the site. Specific measures to protect nesting birds are also described.

- Define and respect clear work area limits.
- Complete all pre-construction and construction activities outside of the tidewater goby peak breeding season (April through June), to the extent feasible.
- Report all dead or injured listed or sensitive animals immediately.
- Do not disturb, capture, handle, or move animals, or their nests. If any wildlife is encountered during the course of Project activities, said wildlife shall be allowed to freely leave the area unharmed.

- Institute a litter control program during the course of construction/maintenance activities. Covered trash receptacles will be placed at each designated work site and the contents properly disposed of at the end of the day at a minimum and more often as necessary. No foodstuffs or associated trash, containers, etc. would be left overnight.
- Prohibit pets on the job site.
- Complete all work during daylight hours. Night-time work (and use of artificial lighting) will not occur.

2.4.3.1 *Nesting Bird Protection Measures*

Recommended specific measures for protection of nesting birds are presented in MRS (2011) and summarized here.

- Equipment mobilization and vegetation cutting and removal should be conducted outside the breeding season (February 15 through August 31, for all birds except raptors which can nest as early as December 1).
- If vegetation maintenance must occur during the nesting season (including raptors), a qualified biologist will conduct nesting bird surveys prior to the work. If nesting is observed within or immediately adjacent to the work area, a buffer of at least 100 feet (500 feet for raptors) will be established, marked, monitored, and maintained until the nest is abandoned or the young have fledged.
- Aquatic vegetation removal should be conducted in one year, to the extent feasible, to reduce repeated impacts to nesting birds.
- Work will be during daylight hours only.
- Equipment should maintain speeds of less than 5 mph in the water.
- Work should be monitored by a qualified biologist who can flush birds away, salvage birds that could be harmed by the work, and check for new nesting activity as the work progresses.
- The biological monitor should conduct environmental training for all workers.

Chapter 3

Action Area Description

3.1 Extent of Action Area

Under Section 7 of the ESA, the Federal action area is defined as the reach of direct and indirect effects, as well as the analysis area for the BA. The Federal action area is also the area in which baseline conditions and cumulative effects are analyzed. For this BA, the Federal action area is defined as the Bird Refuge (lake and adjacent uplands) and the Zoo lands immediately adjacent to the west side of the lake (including the areas to be restored on the Zoo property).

3.2 Physical Conditions

Aquatic habitat within the Bird Refuge lake is characterized by shallow open water with a bottom substrate almost uniformly composed of silty, anoxic, mud. Normal depth of the lake was measured at 3 to 4 feet and evaporation rate was reported at 3 feet per year (Penfield & Smith 1985). Salinity varies from 0.8 to 8.0 parts per thousand (ppt) according to recent 2008 to 2011 monitoring and sampling by the City (City of Santa Barbara, Creek Division 2011). Historically salinity varied from 3.5 to 7.5 ppt and is considered brackish water because freshwater is less than 0.5 ppt (Penfield & Smith 1985). The temperature of the lake can vary from 10 to 28 degrees Celsius. The top sediment layer (2 to 5 feet) is organic silt and clay. The middle sediment layer (2 to 8 feet) is elastic clay with interbeds of sand, and the bottom layer (to 14 feet) is silty sand to poorly graded gravel (Penfield & Smith 1985).

3.2.1 Wildlife Species Present in Refuge

Herpetological surveys conducted in April 2011 observed numerous red-eared sliders (*Trachemys scripta elegans*), a non-native turtle, as well as a few southwestern pond turtles (*Emys marmorata pallida*) (Cardno ENTRIX 2011a). The turtles use the margins of the lake and islands, including mats of tules with the stems parallel to the water surface. The non-native soft-shelled turtle (*Apalone* sp.) and snapping turtle (*Chelydra serpentina*) are also present (S. Sweet personal communication 2011).

Other wildlife observed at the Bird Refuge include raccoon (*Procyon lotor*), brush rabbit (*Sylvilagus bachmani*), deer mice (*Peromyscus maniculatus*), treefrog (*Pseudacris regilla*), western fence lizard (*Sceloporus occidentalis*), gopher snake (*Pituophis catenifer*), and bullfrog (*Rana catesbeiana*) (Barron 2011).

Avian surveys of the Bird Refuge in 2008-2009 observed 47 species, and 17 of these species exhibited some form of breeding behavior (MRS 2011). The most likely species to nest in or near the emergent vegetation types to be removed by maintenance activities are:

<u>Species</u>	<u>Potential Start of Nesting</u>
pied-billed grebe	April 15
great blue heron	March 1
black-crowned night heron	March 15
green heron	March 20
mallard	March 1
ruddy duck	April 20
American coot	April 20
marsh wren	Late April
common yellowthroat	April 15
song sparrow	February 15
red-winged blackbird	March 15
brown-headed cowbird	April 15

In addition to these species, several others may nest in upland vegetation adjacent to the emergent vegetation to be cleared. Nesting can extend through August.

3.2.2 Vegetation Communities

Dense stands of California bulrush (*Scirpus californicus*) and cattails (*Typha* sp.) are present along much of the shoreline. Three islands are present in the pond and are heavily overgrown with non-native *Myoporum* sp. with a border of cattails/bulrushes (SAIC 2010). The western island has dense emergent vegetation between it and the north shore. Of the vegetation present along the shoreline and on the islands, approximately 28 percent was cattails and bulrushes, 12 percent was native upland brush, 15 percent was *Myoporum*, 23 percent was other non-native species, 5 percent was other native species, and 9 percent was bare ground (SAIC 2010). [Numbers do not add to 100 percent due to rounding.]

Upland habitat around the Refuge lake varies considerably. From the intersection of Cabrillo Boulevard and Los Patos Way west to the tidegate, the upland habitat is composed of manicured lawn, a paved bike path, and Cabrillo Boulevard. Continuing northward around the western edge of the lake, the upland area south and east of the Santa Barbara Zoo, along the lake outlet arm, is comprised of a moderately steep slope densely vegetated with *Myoporum* and palm trees up to the Zoo railroad tracks. North of the outlet arm, to the far northwestern corner of the lake, the upper banks are relatively sparsely vegetated with evidence of recent vegetation removal and some plantings present as part of an ongoing vegetation restoration project. Stands of *Eucalyptus* provide a shaded canopy over portions of this area. From the northwestern corner east to the parking area on Los Patos Way, the upland has patches of mixed coyote brush (*Baccharis pilularis*) and sagebrush (*Artemisia* sp.) as well as other native species that have been planted there. This vegetated area ranges from approximately 60 to 135 feet in width from the lake edge. A fence line separates this northern area from the berm of the railroad tracks immediately north. This northern area was interspersed with hard-packed dirt trails. A small storm drain inlet enters the lake approximately 500 feet east of the northwest corner, and has a small footbridge crossing it.

3.2.3 Climate

The action area has warm, dry summers and cool winters. Average annual precipitation for Santa Barbara is 18.6 inches. February is the wettest month on average (4.69 inches), while July is the driest (0.0 inch). The average maximum temperature is 70°F, while the average minimum is 52°F. August is the warmest month on average, while December is the coolest month (U.S. Climate Data 2011).

3.2.4 Concerns

The lake is hypertrophic due to excess organic material (nutrients). High levels of anaerobic bacteria produce hydrogen sulfide. Methane gas is also produced. Problems include floating algal mats, flies, mosquitoes, and dead fish. Salt water intrudes into the lake at times during high tides. Nutrients of concern are ammonia and phosphates (Penfield & Smith 1985).

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Chapter 4

Species/Critical Habitat Considered

A literature review and field surveys for the project determined that the federally listed threatened or endangered species in Table 4-1 are or could be present in the action area and are addressed in this BA.

Table 4-1 Federally Listed Endangered, Threatened, and Candidate Species Potentially Present in Action Area

Common Name	Scientific Name	Status	Critical Habitat
tidewater goby	<i>Eucyclogobius newberryi</i>	endangered	not in action area
western snowy plover	<i>Charadrius alexandrinus nivosus</i>	threatened	not currently in action area, but proposed for ocean side of Cabrillo Boulevard

This section includes a brief description of each of these species. As noted in Table 4-1, no critical habitat for any of the species is present in the action area.

4.1 Tidewater Goby

- Federally listed as endangered on March 7, 1994 (USFWS 1994).
- Critical habitat designated on November 10, 2000 for populations in Orange and San Diego counties south of the Los Angeles Basin (USFWS 2000). On January 31, 2008, revised critical habitat was established in Del Norte, Humboldt, Mendocino, Sonoma, Marin, San Mateo, Santa Cruz, Monterey, San Luis Obispo, Santa Barbara, Ventura, and Los Angeles counties (USFWS 2008). The revised critical habitat included nine geographical areas in Santa Barbara County, but the action area was not included in this designation.
- A recovery plan for the Tidewater Goby was finalized on December 7, 2005 (USFWS 2005a).
- Designated as a California Species of Special Concern in 1980.

4.1.1 General Description

Tidewater gobies are small, semi-translucent, cylindrical fish reaching about 2 inches total length with little sexual dimorphism in size. The pelvic fins are fused into an oval disc on the ventral side of the chest. The small scales are embedded in the skin and usually not visible. Scales are absent from the head and the anterior one third of the body. Breeding females develop dark brown or blackish breeding color on the body and dorsal and anal fins. The head and tail remain brownish or greenish. The dorsal one quarter of the first dorsal fin remains cream colored or yellowish orange. This area is translucent in smaller, non-breeding individuals and is one of the

best identification characters separating it from similar gobies in California. The oval disc of the fused pelvic fins separates this fish from all but other gobies (USFWS 2008).

4.1.2 Distribution

4.1.2.1 *Historic Distribution*

Historically, the range of the tidewater goby extended from the mouth of the Smith River in Del Norte County south to Agua Hedionda Lagoon in San Diego County. Large gaps existed in this range with very few records along the north coast from the Russian River to just south of the Eel River. No records are known from the Carmel River south to Arroyo de la Cruz in the Big Sur area. These gaps are areas where the coastline is steep and stable lagoons do not develop at the mouths of streams.

4.1.2.2 *Current Distribution*

The tidewater goby has been extirpated at many localities, and many other existing localities are so small or ephemeral that a continuous population is not supported. In 2005, twenty three (17 percent) of 134 documented historical locations for the tidewater goby were considered extirpated and 55 to 71 (41 to 52 percent) were considered so small or degraded that long-term persistence is uncertain (USFWS 2005a).

4.1.3 Habitat

Populations of tidewater gobies are usually found in coastal lagoons, estuaries, and in low-gradient sections of inflowing streams (USFWS 2008, Moyle 2002). Sand bars formed seasonally block lagoons from the ocean and keep the lagoons brackish and cool with bottoms of sand and silt (Moyle 2002). Open areas are critical for breeding, while vegetation is critical to provide refuge from high flows (Moyle 2002). Tidewater gobies are usually found in water with salinities <10 ppt, but are capable of living in saline water ranging from 0 to 50 ppt. Suitable water temperatures range from 8 to 23°C, suitable water depth is 25 to 100 cm, and water flow needs to be slow moving but not stagnant (Moyle et al. 1995). Clean, unconsolidated sandy substrate is needed for breeding burrows, but non-breeding individuals range over mud, rocks, vegetated areas, and among algal mats and dense macrophytes also.

4.1.4 Life History

In the spring (April or May), after lagoons have stabilized, male tidewater gobies excavate burrows into sandy substrate about 4 to 8 inches long and hollow out an area under the sand. The adult females actively compete with each other for access to the burrows. Dominant females deposit 300 to 600 eggs in a burrow which the male guards for several days, depending on the temperature. Females can produce a clutch of eggs about every two weeks (USFWS 2005a). Spawning can occur all year but most is from March through November (Moyle 2002) with a peak in southern California in April through June (Swift et al. 1989).

Tidewater gobies are micro-carnivores and will consume almost any animal small enough to be swallowed whole such as snails, mysid shrimp, amphipods, isopods, chironomid larvae, various other aquatic insects, isopods, ostracods, oligochaetes, etc. They feed both day and night and largely forage on the bottom substrate (Moyle 2002).

4.1.5 Threats

Threats to the tidewater goby are primarily actions that disrupt the normal or natural changes in coastal lagoons. In addition, these lagoons are usually at the downstream end of larger drainages that have often been impacted by a variety of anthropogenic disturbances to water quality, sediment load, and flow regime. Major threats include destruction, modification, or curtailment of its habitat due to alteration of flow regimes from construction of dams, diversions, and levees, decreased water quality, and competition and predation from invasive species (USFWS 2005a).

4.1.6 Species Status in Action Area

Tidewater gobies were first reported in the Bird Refuge outflow lagoon on the beach side of Cabrillo Boulevard (separated from the lake by a closed weir) in 1993 and 1995 (Ambrose 1995). Although no surveys appear to have been conducted in the lake, the Refuge lake has the potential to support tidewater gobies. During informal consultation, USFWS personnel suggested surveys to confirm the presence or absence of the tidewater goby in the Refuge lake. USFWS personnel also confirmed that it was acceptable to perform surveys outside of the protocol sampling dates (July 1 to October 31) due to conditions at the project site. A survey for tidewater goby was performed on April 5, 2011 by Cardno ENTRIX biologists, which confirmed that tidewater gobies are present in the Bird Refuge lake (Cardno ENTRIX 2011b).

The survey consisted of six seine hauls, resulting in the capture of a single, large adult tidewater goby on the sixth haul under Section 10(a)(1)(A) permit TE815144-7 for incidental take of the tidewater goby. These hauls were taken near the Bird Refuge parking area, on Los Patos Way, at the northeast end of the lake where a small beach and vegetation-free area existed. For the purpose of the USFWS Tidewater Goby Survey Protocol, the presence of one individual tidewater goby resulting from surveys constitutes evidence of an extant population. Thus, the survey was discontinued after the capture of a confirmed tidewater goby. The location of the haul where the goby was captured was 34°25'18.30"N, 119°39'29.38"W.

The limited sampling in the Bird Refuge lake did not detect any evidence of reproduction in the lake, although the sampling on April 5, 2011 was prior to or at the beginning of the breeding season for this species.

4.2 Western Snowy Plover

- Listed as threatened on March 5, 1993 (USFWS 1993).
- Critical habitat designated on September 29, 2005. Final rule to re-designate critical habitat along the coasts of California, Oregon, and Washington (USFWS 2005b). USFWS proposed to revise critical habitat on March 21, 2011 (USFWS 2011a).
- Designated as a California Species of Special Concern in 1981.
- A recovery plan for the western snowy plover was finalized in 2007 (USFWS 2007).
- Protected under the Migratory Bird Treaty Act of 1972.

4.2.1 General Description

The western snowy plover is a small shorebird, about 6 inches long, with a thin dark bill, pale brown to gray upper parts, white or buff colored belly, and darker patches on its shoulders and head, white forehead, and supercilium (eyebrow line). Snowy plovers also have black patches above their white forehead and behind the eye. Juvenile and basic (winter) plumages are similar to adults, but the black patches are absent. Some breeding males, especially in the southern portion of the species' range, may exhibit a rusty or tawny cap. Their dark gray to black legs are a useful characteristic when comparing them to other plover species (Page et al. 1995 as cited by USFWS 2011b).

4.2.2 Distribution

Western snowy plovers occupy the Pacific coast from Washington down to Mexico, and as far inland as Kansas and Texas (USFWS 1993). The Pacific coast population is genetically isolated from inland populations and is defined as those individuals that nest adjacent to or near tidal waters, and includes all nesting colonies on the mainland coast, peninsulas, offshore islands, adjacent bays, and estuaries (USFWS 1993). Coastal populations consist of both resident and migratory birds although most birds winter south of Bodega Bay, California (Page 1986 as cited by USFWS 1993).

Records indicate that nesting western snowy plovers were once more widely distributed in coastal California, Oregon, and Washington. In Washington western snowy plovers formerly nested at five coastal locations of which only three are currently known to be active, representing a 40 percent decline in active breeding sites (USFWS 2011b). In Oregon western snowy plovers historically nested at 29 locations on the coast of which only 10 are currently known to be active, representing a 65 percent decline in active breeding sites (USFWS 2006 as sighted by USFWS 2011b). In California, there has also been a significant decline in breeding locations, especially in southern California (USFWS 2011b). Prior to 1970 western snowy plovers bred at 53 known locations, and by 1981 only 20 of those sites remained active (USFWS 1993).

4.2.3 Habitat

The Pacific coast population of the western snowy plover breeds primarily on coastal beaches from southern Washington to southern Baja California, Mexico (USFWS 2001). Nesting typically occurs above the high tide line in flat, open areas with sandy or saline substrates with sparse to absent vegetation (USFWS 1993). Nesting may also occur in sand spits, dune-backed beaches, and salt pans at lagoons and estuaries (USFWS 2001). Less common nesting habitat includes bluff-backed beaches, dredged material disposal sites, salt pond levees, dry salt ponds, and river bars (USFWS 2001). Suitable nesting habitat is distributed throughout the listed range, but may be widely separated by areas of rocky shoreline.

4.2.4 Life History

The western snowy plover breeding season extends from mid March to mid September. Plovers may have more than one brood in a nesting season and are polyandrous (USFWS 1993). These birds tend to be site faithful with the majority returning to the same nesting location in subsequent years (USFWS 1993). Nests consist of shallow scrapes or depression in the sand. Typical clutch size is three eggs with an average incubation time of 27 days, and chicks fledge the nest around 31 days (USFWS 1993). Females typically desert the brood shortly after

hatching, leaving the chick rearing duties to the male (USFWS 2011b). Females may renest if another male is available and if time remains in the season to do so. Males attend the young until they fledge (USFWS 2011b). Adult plovers do not feed their chicks, rather they lead them to suitable feeding areas (USFWS 2011b). Adults will present a broken-wing or tail-drag display when a predator approaches a brood or nest (USFWS 2011b).

Western snowy plovers primarily feed on invertebrates found in wet sand, among kelp within the intertidal zone, in sandy areas above the high tide, in salt pans, spill sites, and edges of salt marshes and salt ponds (USFWS 1993).

4.2.5 Threats

Poor reproductive success, resulting from human disturbance, predation, and inclement weather, combined with permanent or long-term loss of nesting habitat to encroachment of non-native European beachgrass (*Ammophila arenaria*) and urban development has lead to a decline in active nesting, as well as an overall decline in the breeding and wintering population of the western snowy plover along the Pacific coast (USFWS 1993).

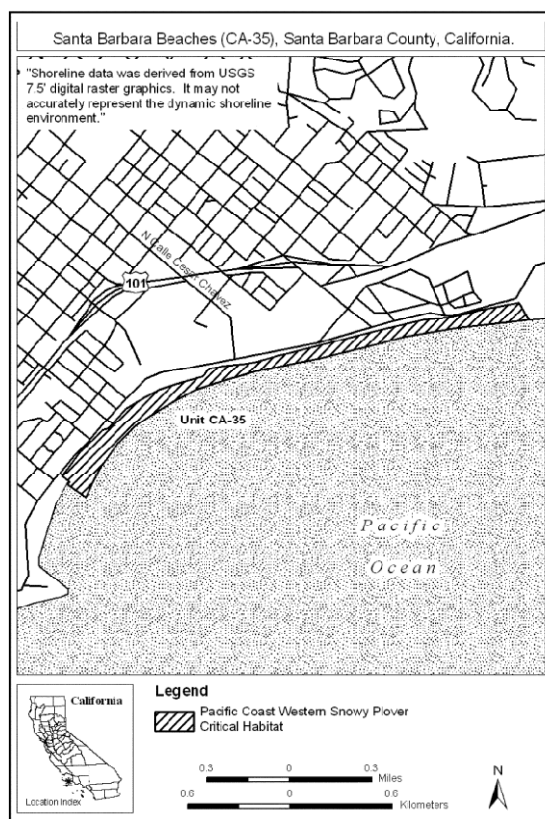
Human activities, such as walking, jogging, running pets, horseback riding, and vehicle use, are key factors in the ongoing decline in breeding sites and populations. The nesting season of the western snowy plover (March through September) coincides with the period of greatest human use (Memorial Day through Labor Day) on beaches of the west coast. Intensive beach use by humans may result in abandonment of nest sites, reductions in nest density, and reductions in nesting success (USFWS 2011b).

4.2.6 Species Status in Action Area

The Bird Refuge lake is in close proximity to proposed critical habitat for the western snowy plover. On March 22, 2011, revised critical habitat was proposed by the USFWS for the snowy plover that included 65 acres of habitat in Santa Barbara. A parcel of the 65 acres, labeled CA-35, is located near the Refuge and extends about 1.8 miles along the coast from the Refuge to Santa Barbara Harbor. This area is an important wintering area with up to 111 western snowy plovers recorded during a single season. While this area includes habitat features essential to conservation of the species, the Refuge does not and is therefore not designated as critical habitat. Refer to Figure 4-1 and Figure 4-2 for a geographical depiction of CA-35.



Figure 4-1. Western Snowy Plover Proposed Critical Habitat Location



Source: USFWS 2011a

Figure 4-2. Unit CA-35: Western Snowy Plover Proposed Critical Habitat

Chapter 5

Effects Analysis

5.1 Introduction

A BA includes an analysis of direct and indirect potential effects of a proposed action on federally listed, proposed, or candidate species. This section evaluates the potential effects on two species with the potential to occur within the action area. Effects are presented by activity and then summarized for each species. Evaluation of effects is based on both the context (e.g., type of activity) and intensity (e.g., duration) of the action. Effects of the proposed action on nesting birds protected under the Migratory Bird Treaty Act are also described.

5.1.1 Cumulative Effects

Cumulative effects under the ESA include the effects of future state, tribal, local government, or private actions that are reasonably certain to occur within the action area of the federal action subject to consultation. Future federal actions that are unrelated to the Proposed Action are not considered because they require separate consultation pursuant to Section 7 of the ESA. While the USFWS does not have the authority under Section 7 of the ESA to affect private actions, any such action resulting in the incidental take of an ESA-listed animal species requires the issuance of an incidental take permit from the USFWS.

5.1.2 Critical Habitat

No critical habitat for either species currently exists within the action area; however, critical habitat for the western snowy plover has been proposed along East Beach adjacent to the action area.

5.2 Effects on Species by Activity

5.2.1 Aquatic Vegetation Removal, Cleanup, and Disposal.

5.2.1.1 *Tidewater Goby*

Habitat for tidewater gobies in the Refuge lake appears to be adequate to at least support foraging. Tidewater gobies are expected to occur in the lake only occasionally, possibly entering from the beach lagoon during limited periods through the tidegate connection to the lagoon. Adults of this species could use benthic open water habitat as well as emergent vegetation habitat. Bottom sediments are primarily very silty/muddy, which are not suitable for breeding burrow construction, and it is unlikely that tidewater gobies are able to successfully breed in the lake. Tidewater gobies generally require a sand substrate for breeding burrows. As noted above, no juvenile gobies have been detected in the lake. Thus, vegetation removal as proposed is not expected to interfere with goby breeding. Furthermore, vegetation removal would be conducted outside the breeding season, in the winter, when only larger adults would be present and when population numbers are typically lower. All life stages of tidewater gobies may use aquatic vegetation as refuge habitat and, thus, could potentially be injured by vegetation cutting and removal, if present at the locations where the work would occur.

A total of 0.93 acre of vegetation is planned for removal. This constitutes approximately 20 percent of the targeted vegetation types (cattails and tules) present in the Refuge, and a considerably smaller proportion (less than 4 percent) of the open water habitat would be temporarily disturbed during maintenance activities. Disturbance in open water would be primarily by movement of the cookie cutter and harvester along the edge of the vegetation to be cut. Vibration and underwater noise from the cookie cutter would tend to disperse fish, including tidewater gobies, out of the work area, especially since movement of the cookie cutter into the vegetation would be slow. Turbidity caused by cutting the rhizomes in the sediment would also be likely to cause the fish to move out of the work area. Because the tidewater goby population in the Refuge lake is likely to be small (due to little or no breeding, a short life span of one to two years, and a large population decline during winter), disturbances in a small portion of the habitat would have a low potential to affect any tidewater gobies.

Work within the grouted sandstone box culvert along Old Coast Highway and the concrete-lined channel that enters the bird refuge from the north could affect tidewater gobies, if they are present. A pre-maintenance survey of these areas no more than 7 days prior to maintenance initiation would be conducted to verify that no gobies are present. If gobies are determined to be present during the survey, a qualified biologist with applicable permits/approvals will conduct a tidewater goby rescue and relocation in order to clear the maintenance areas. Implementation of these avoidance measures would minimize the potential for effects on this species.

5.2.1.2 *Western Snowy Plover*

Western snowy plovers do not occur within the Refuge lake where aquatic vegetation removal will be conducted. Although vegetation removal will be performed in the winter when western snowy plovers are present in the East Beach area, no noise disturbance to plovers associated with vegetation removal equipment would occur due to distance (over 1,400 feet) and traffic on Cabrillo Boulevard. No effects on this species are expected as a result of this action.

5.2.1.3 *Migratory Bird Nesting*

Vegetation clearing activities are scheduled in the winter (January or February) prior to bird nesting, with the exception of the song sparrow and owls and raptors. The latter two types of birds were not observed nesting at the Refuge during the 2008-2009 surveys (MRS 2011) and are unlikely to be affected. Measures to avoid effects on migratory bird nesting include worker environmental training and conducting pre-work nesting bird surveys.

5.2.2 Dislodged (Senescent and/or Green) Aquatic Vegetation Maintenance

5.2.2.1 *Tidewater Goby*

Tidewater gobies typically occupy the benthic portion of the water column. Thus, use of a boat at the water surface to tow floating vegetation clumps to the beach would not affect this species. Pulling floating clumps to shore with chains or ropes also would have minimal effects on the species. The minor disturbances caused by pulling the clumps to shore would cause tidewater gobies to move away from the activity and thus avoid injury. Because the vegetation is already loose and floating, it does not constitute effective habitat or refuge cover for gobies. Its removal

would not result in loss of habitat for tidewater gobies. No effects on this species are expected as a result of this action

5.2.2.2 *Western Snowy Plover*

As described above, western snowy plovers do not occur within or along the shore of the Refuge lake where floating aquatic vegetation removal will be conducted. Pulling floating patches of tules to shore with a small boat or with chains/ropes from shore would not disturb western snowy plovers wintering on East Beach due to the low amount of noise produced by these activities and the distance (over 300 feet from the tidegate at Cabrillo Boulevard and much farther for other areas within the lake) the work would be from the beach habitat used by the plovers. No effects on this species are expected as a result of this action.

5.2.2.3 *Migratory Bird Nesting*

Only small areas where the floating vegetation is pulled to shore would be affected. Most of these areas have little to no existing vegetation (e.g., at the “beach” near Los Patos Way and at the tidegate), and removal of the vegetation at those locations would not affect any birds nesting in the emergent vegetation along the shoreline. Conducting this work during outside of the breeding season (February 15 to August 31) would avoid disturbance to nesting of all but raptors, if any were to nest in the area.

5.2.3 Habitat Restoration

5.2.3.1 *Tidewater Goby*

Habitat restoration and enhancement in upland areas around the margin of the lake would not affect tidewater gobies within the Refuge lake because all activities would be outside the water. The minor soil disturbance resulting from planting of native species would not result in runoff of sediments to the lake as the soil would be covered with mulch or other materials to prevent the growth of weedy species while the native species become established. Once established, the native species would stabilize the soil to minimize the runoff of sediment to the lake.

Wetland creation along the lake side of the tules along the southern bank would cause a temporary disturbance to habitat that could be used by the tidewater goby. Planting in shallow water along the shoreline at the restoration sites on the western side of the Refuge lake would also temporarily disturb potential habitat for the tidewater goby. Any individuals in those areas would move away from the disturbance during the planting process but subsequently could use the areas again.

5.2.3.2 *Western Snowy Plover*

Habitat restoration would not occur within critical habitat for the western snowy plover, and the proposed areas of restoration around the Refuge lake currently are not suitable habitat for this species. Thus, no effects of restoration on the western snowy plover are anticipated.

5.2.3.3 *Migratory Bird Nesting*

Habitat restoration in upland habitats as well as along the south margin of the Refuge lake would have the potential to affect nesting birds if conducted between February 15 and August 31. Once

restoration is complete and the new vegetation becomes established, habitat for bird nesting would be enhanced or expanded.

5.3 Cumulative Effects

No other projects are currently planned for the Refuge. One small (about 0.5 acre) restoration site at the northwest corner of the Refuge on the Zoo property is being developed and will be maintained and monitored to ensure establishment of the native plants. The Project will not result in a considerable contribution to cumulative impacts at the Refuge.

Chapter 6

Conclusions and Determinations of Effects

Effects of the Proposed Action on ESA protected species were evaluated based on the following definitions (50 CFR 402.02):

No effect – the appropriate conclusion where the Proposed Action will not affect listed species or critical habitat.

Not likely to adversely affect – the appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those effects extremely unlikely to occur.

Likely to adversely affect – the appropriate conclusion if any adverse effect to listed species may occur as a direct or indirect result of the proposed action (including interdependent and interrelated actions), and the effect is not discountable or insignificant.

Jeopardize proposed species/adversely modify critical habitat – the appropriate conclusion if an action would reasonably be expected to directly or indirectly reduce appreciably the likelihood of both the survival and recovery of a listed species by reducing the reproduction, numbers, or distribution of that species, or by modifying critical habitat to the point of preventing the recovery of a listed species.

Based on the definitions above and on the species status descriptions relative to the Proposed Action, this BA concludes the following for each species with the potential to occur within the Action Area.

6.1 Tidewater Goby

The proposed Project may affect, but is not likely to adversely affect the tidewater goby. Biological surveys have only observed tidewater gobies within the action area in 2011 (Cardno ENTRIX 2011b). Vegetation removal activities would remove cover from potential habitat for this species but would not result in a loss of aquatic habitat. Disturbance during vegetation removal would affect less than 4 percent of the open water habitat and approximately 20 percent of the emergent vegetation. However, most of the emergent vegetation present would remain undisturbed. Restoration in upland areas around the margins of the lake would have minimal benefits for tidewater gobies because aquatic habitat would not be improved. No critical habitat is present within the action area; therefore, no effect on critical habitat would occur.

6.2 Western Snowy Plover

Vegetation removal and restoration within and along the margins of the Refuge lake would have no effect on the western snowy plover because none would be present in those areas and the work would be too far from known wintering areas on East Beach for noise to affect the birds.

6.3 Migratory Bird Nesting

Implementation of the Project during the winter (January or February) would avoid the nesting season for most bird species that could be present. Early nesting by the song sparrow could occur by mid February and raptors could be nesting as early as December 1. However, no raptor nesting was observed during the bird surveys in 2008-2009. Avoidance measures that are part of the project (e.g., pre-work surveys for nesting birds) would minimize the potential for effects on nesting birds.

Chapter 7

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